

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

1 (Currently Amended) A moving image coding device that makes a compression and coding for moving images, said image coding device comprising:

means for analyzing images, which exist in a constant interval, to observe characteristics of each image;

based on said observed characteristics, means for estimating complexity degrees of said images;

means for pre-allocating ~~a code~~ code quantity to said constant interval, and computing ~~a target~~ target code quantity with which said ~~pre-allocated~~ allocated code quantity is assigned to each image for all images within said constant interval based on said estimated complexity ~~degrees~~ degrees;

a buffer which ~~is~~ accumulates a code ~~accumulating codes that is~~ are generated as a result of having coded said images;

when said computed target code quantity is assigned to each of said images, means for ~~predicting~~ calculating a transition of occupancy in said buffer of said accumulated code with said computed target code quantity and ~~regulating to regulate~~ regulating said target code quantity so that the predicted transition of the buffer occupancy ~~said buffer~~ does not give rise to an overflow or an underflow; and

means for making a compression and coding for said images according to said regulated target code quantity.

2 (Original) The image coding device according to claim 1, wherein said means for estimating complexity degrees of said images is configured so as to estimate complexity degrees of said images, based on statistics of said analyzed images.

3 (Currently Amended) The image coding device according to claim 1, wherein said means for ~~estimating~~ predicting complexity degrees of said images is configured so as to

predict complexity degrees of said images, based on said complexity degrees of said images that were already analyzed.

4 (Currently Amended) The image coding device according to claim 1, wherein, in coding said images, which were input, with a predetermined coding method, said means for ~~analyzing observing said characteristics~~ is configured so as to observe code quantity, which are generated in coding said images, ~~or said generated code quantity~~, and a value of a quantization scale used.

5 (Currently Amended) The image coding device according to claim 1, wherein said means for ~~analyzing observing said characteristics~~ is configured so ~~that that~~ in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images; and

in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

6 (Currently Amended) The image coding device according to claim 1, further comprising ~~wherein said moving image coding device includes~~ means for reducing the size of said images that were input; and

wherein, said means for ~~analyzing observing complexity degrees~~ is configured so ~~that that~~ in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images that were input; and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

7 (Currently Amended) The image coding device according to claim 1, further comprising ~~wherein said moving image coding device includes~~ means for reducing the size of said images that were input, and

wherein said means for ~~analyzing observing complexity degrees~~ is configured so ~~that that~~ in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images;

and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

8 (Currently Amended) The image coding device according to claim 1, further comprising ~~wherein said moving image coding device includes~~ means for reducing the size of said images that were input, and

wherein said means for analyzing ~~observing said complexity degrees~~ is configured so ~~that that:~~ in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images; and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

9 (Currently Amended) The image coding device according to claim 1, wherein said means for estimating ~~predicting~~ complexity degrees is configured so as to predict complexity degrees for each picture type.

10 (Currently Amended) The image coding device according to claim 1, wherein, in coding said images input by use of an image coding technique using a Group of Pictures (GOP) ~~that is applied in MPEG1 or MPEG2~~, said constant interval ~~fixes an interval length of a GOP, and~~ is a multiple of N (Integer) of said interval length of said GOP.

11 (Cancelled)

12 (Currently Amended) A moving image coding device that makes a compression and coding for moving images, said image coding device comprising:

means for analyzing images, which exist in a first constant interval, to observe characteristics of each image;

based on said observed characteristics, means for estimating complexity degrees of said images;

means for predicting said complexity degrees of said images that exist in a second constant interval that succeeds said first constant interval;

means for allocating ~~a code~~ code quantity to a combined interval in which said first constant interval and said second constant interval ~~are were~~ combined, based on said estimated complexity degrees and said predicted complexity degrees, to compute a target ~~target~~ code quantity with which said allocated code quantity is assigned to each image for all images within said combined interval;

a buffer which ~~is accumulates a code~~ accumulates codes that ~~is are~~ generated as a result of having coded said images;

when said computed target code quantity is assigned to each of said images, means for ~~predicting~~ calculating a transition of occupancy in said buffer of said accumulated code with said computed target code quantity and regulating ~~to regulate~~ said target code quantity so that the predicted transition of the buffer occupancy ~~said buffer~~ does not give rise to an overflow or an underflow; and

means for making a compression and coding for said images according to said regulated target code quantity.

13 (Original) The image coding device according to claim 12, wherein said means for estimating complexity degrees of said images is configured so as to estimate complexity degrees of said images, based on statistics of said analyzed images.

14 (Currently Amended) The image coding device according to claim 12, wherein said means for predicting said complexity degrees of said images is configured so as to predict complexity degrees of said images, based on said complexity degrees of said images that were already analyzed.

15 (Currently Amended) The image coding device according to claim 12, wherein, in coding said images, which were input, with a predetermined coding method, said means for analyzing ~~observing~~ said characteristics is configured so as to observe said code quantity, which are generated in coding said images, ~~or said generated code quantity~~, and a value of a quantization scale used.

16 (Currently Amended) The image coding device according to claim 12, wherein said means for analyzing ~~observing said characteristics~~ is configured so that ~~that~~—in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images; and
in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

17 (Currently Amended) The image coding device according to claim 12, further comprising ~~wherein said moving image coding device includes means for~~ reducing the size of said images that were input; and

wherein, said means for analyzing ~~observing complexity degrees~~ is configured so that ~~that~~—in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images that were input; and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

18 (Currently Amended) The image coding device according to claim 12, further comprising ~~wherein said moving image coding device includes means for~~ reducing the size of said images that were input, and

wherein said means for analyzing ~~observing complexity degrees~~ is configured so that ~~that~~—in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images; and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

19 (Currently Amended) The image coding device according to claim 12, wherein said moving image coding device includes means for reducing the size of said images that were input, and

wherein said means for analyzing ~~observing said complexity degrees~~ is configured so that ~~that~~—in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images;

and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

20 (Original) The image coding device according to claim 12, wherein said means for predicting complexity degrees is configured so as to predict complexity degrees for each picture type.

21 (Cancelled)

22 (Currently Amended) The image coding device according to claim 12, wherein, in coding said images input by use of an image coding technique using a Group of Pictures (GOP) that is applied in MPEG1 or MPEG2, said combined interval ~~fixes an interval length of a GOP, and~~ is a multiple of N (Integer) of said interval length of said GOP.

23 (Currently Amended) A moving image coding method of making a compression and coding for moving images, employing a device having a buffer which accumulates a code for coding, said image coding method comprising steps of:

analyzing images; which exist in a constant interval, to observe characteristics of each image;

based on said observed characteristics, estimating complexity degrees of said images; pre-allocating code quantity to said constant interval, and computing target code quantity with which said pre-allocated code quantity is assigned to each image for all images within said constant interval based on said estimated complexity degrees;

when said computed target code quantity is assigned to each of said images, predicting ~~calculating~~ a transition of occupancy in said buffer of said accumulated code with said computed target code quantity and regulating to regulate said target code quantity so that the predicted transition of the buffer occupancy said buffer does not give rise to an overflow or an underflow; and

making a compression and coding for said images according to said regulated target code quantity.

24 (Original) The image coding method according to claim 23, wherein in said step of estimating said complexity degrees of said images said complexity degrees of said images are estimated, based on statistics of analyzed images.

25 (Currently Amended) The image coding method according to claim 23, wherein in said step of ~~estimating~~predicting said complexity degrees of said images said complexity degrees of said images are ~~estimated~~predicted, based on said complexity degrees of said images that were already analyzed.

26 (Currently Amended) The image coding method according to claim 23, wherein, when said images that were input are coded with a predetermined coding method, in said step of analyzing images ~~observing said characteristics are observed~~ said code quantity is observed, which is ~~are~~ generated in coding, ~~or said generated code quantity~~, and also observed is a value of a quantization scale used.

27 (Currently Amended) The image coding method according to claim 23, wherein, in said step of analyzing images ~~observing said characteristics~~, in an event of making an intra-frame coding for images that were input, a correlation is observed between neighboring pixels within a frame of said images, and in an event of making an inter-frame predictive coding for images that were input, inter~~intra~~-frame prediction error quantity of said images that were input is observed.

28 (Currently Amended) The image coding method according to claim 23, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of ~~estimating~~observing said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images that were input, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

29 (Currently Amended) The image coding method according to claim 23, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of ~~estimating~~observing said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation observed between neighboring pixels within a frame of said reduced images, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

30 (Currently Amended) The image coding method according to claim 23, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of ~~estimating~~observing said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

31 (Currently Amended) The image coding method according to claim 23, wherein in said step of ~~estimating~~observing said complexity degrees predict complexity degrees for each picture type.

32 (Currently Amended) The image coding method according to claim 23, wherein, in coding said images input by use of an image coding technique using a Group of Pictures (GOP)~~that is applied in MPEG1 or MPEG2~~, said constant interval fixes an interval length of a GOP, and is a multiple of N (Integer) of said interval length of said GOP.

33 (Cancelled)

34 (Currently Amended) A moving image coding method of making a compression and coding for moving images, employing a device having a buffer which accumulates a code~~for coding~~, said image coding method comprising steps of:

analyzing images, which exist in a first predetermined interval, to observe characteristics of each image;

based on said observed characteristics, estimating complexity degrees of said images;

predicting complexity degrees of said images that exist in a second constant interval that succeeds said first constant interval;

allocating a code~~code~~ quantity to a combined interval in which said first constant interval and said second constant interval are~~were~~ combined, based on said estimated complexity degrees and said predicted complexity degrees, to compute a target code quantity with which said allocated code quantity is assigned to each image for all images within said combined interval;

when said computed target code quantity is assigned, predicting~~calculating~~ a transition of occupancy in said buffer of said accumulated code with said computed target code quantity and regulating ~~for~~ each of said images ~~to regulate~~ said target code quantity so that the predicted transition of the buffer occupancy ~~said buffer~~ does not give rise to an overflow or an underflow; and

making a compression and coding for said images according to said regulated target code quantity.

35 (Original) The image coding method according to claim 34, wherein in said step of estimating said complexity degrees of said images said complexity degrees of said images are estimated, based on statistics of analyzed images.

36 (Currently Amended) The image coding method according to claim 34, wherein in said step of estimating~~predicting~~ said complexity degrees of said images said complexity degrees of said images are predicted, based on said complexity degrees of said images that were already analyzed.

37 (Currently Amended) The image coding method according to claim 34, wherein, when said images that were input are coded with a predetermined coding method, in said step of analyzing images~~observing said characteristics are observed~~, said code quantity, is observed~~which is are generated in coding, or said generated code quantity~~, and also observed is a value of a quantization scale used.

38 (Currently Amended) The image coding method according to claim 34, wherein, in said step of analyzing images to observe~~observing said characteristics of each image~~, in an event of making an intra-frame coding for images that were input, a correlation is observed between neighboring pixels within a frame of said images, and in an event of making an inter-frame predictive coding for images that were input, inter~~intra~~-frame prediction error quantity of said images that were input is observed.

39 (Currently Amended) The image coding method according to claim 34, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of estimating~~observing~~ said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said images that were input, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

40 (Currently Amended) The image coding method according to claim 34, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of estimating~~observing~~ said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation observed between neighboring pixels within a frame of said reduced images, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said images that were input is observed.

41 (Currently Amended) The image coding method according to claim 34, wherein said moving image coding method further includes a step of reducing the size of said images that were input, and

wherein, in said step of ~~estimating~~ observing said complexity degrees, in an event of making an intra-frame coding for said images that were input, a correlation is observed between neighboring pixels within a frame of said reduced images, and in an event of making an inter-frame predictive coding for said images that were input, inter-frame prediction error quantity of said size reduced images is observed.

42 (Currently Amended) The image coding method according to claim 34, wherein in said step of ~~estimating~~ observing said complexity degrees predicts complexity degrees for each picture type.

43 (Cancelled)

44 (Currently Amended) The image coding method according to claim 34, wherein, in coding said images input by use of an image coding technique using a Group of Pictures (GOP) ~~that is applied in MPEG1 or MPEG2~~, said combined interval fixes an interval length of a GOP, and is a multiple of N (Integer) of said interval length of said GOP.

45 (Currently Amended) A program for causing an information processing device, which configures a moving image coding device that makes a compression and coding for moving images, to execute processes of:

analyzing images, which exist in a constant interval, to observe characteristics of each image;

based on said observed characteristics, estimating complexity degrees of said images; pre-allocating code quantity to said constant interval, and computing target code quantity with which said pre-allocated code quantity is assigned to each image for all images within said constant interval based on said estimated complexity degrees;

when said computed target code quantity is assigned to each of said images, predicting ~~calculating~~ a transition of occupancy of a code accumulated in a buffer with said computed

~~target code quantity and regulating of said code to regulate~~ said target code quantity so that said buffer does not give rise to an overflow or an underflow; and

making a compression and coding for said images according to said regulated target code quantity.

46 (Currently Amended) A program for causing an information processing device, which configures a moving image coding device that makes a compression and coding for moving images, to execute processes of:

analyzing images, which exist in a first predetermined interval, to observe characteristics of each image;

based on said observed characteristics, estimating complexity degrees of said images;

predicting complexity degrees of said images that exist in a second constant interval that succeeds said first constant interval;

allocating ~~a code code~~ quantity to a combined interval in which said first constant interval and said second constant interval ~~are~~ were combined, based on said estimated complexity degrees and said predicted complexity degrees, to compute ~~a target target~~ code quantity with which said allocated code quantity is assigned to each image for all images within said combined interval;

when said calculated target code quantity is assigned to each of said images, ~~predicting~~ calculating a transition of occupancy of a code accumulated in a buffer with said ~~computed target code quantity and regulating of said code to regulate~~ said target code quantity so that said buffer does not give rise to an overflow or an underflow; and

making a compression and coding for said images according to said regulated target code quantity.